REMARKS/ARGUMENTS

Claims 1-6 are pending. By this Amendment, claim 1 is amended. Support for the amendments to claim 1 can be found, for example, at page 21 of the present specification, and in original claim 1. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

Rejection Under 35 U.S.C. §103

The Office Action rejects claims 1-6 under 35 U.S.C. §103(a) over U.S. Patent No. 6,338,763 to Hashimura et al. ("Hashimura"). Applicants respectfully traverse the rejection.

Claim 1 recites "[a] steel wire for high-strength spring having superior workability, the steel wire having tempered martensite, the steel wire comprising by mass: C: 0.53 to 0.68%; Si: 1.2 to 2.5%; Mn: 0.2 to 1.5%; Cr: 1.4 to 2.5%; Al: 0.05% or less, excluding 0%; at least one selected from the group consisting of Ni: 0.4% or less, excluding 0%; V: 0.4% or less, excluding 0%; Mo: 0.05 to 0.5%; and Nb: 0.05 to 0.5%; and remainder essentially consisting of Fe and inevitable impurities, wherein the prior austenite grain size number is 11.0 or larger, and a ratio ($\sigma_{0.2}/\sigma_B$) of 0.2% proof stress ($\sigma_{0.2}$) to tensile strength (σ_B) is 0.79 or lower" (emphasis added). Hashimura does not disclose or suggest such a wire.

As indicated above, claim 1 requires a ratio ($\sigma_{0.2}/\sigma_B$) of 0.2% proof stress ($\sigma_{0.2}$) to tensile strength (σ_B) of 0.79 or lower. Hashimura discloses a steel wire, either: (i) having a yield strength ratio of not less than 0.8 and not greater than 0.9; or (ii) having a yield strength ratio of not less than 0.8 and an amount of residual austenite of not greater than 6%. *See* Hashimura, column 4, lines 1 to 14. With respect to the steel wire (i) of Hashimura, the coiling performance (coiling property) of the wire is ensured by setting the yield strength ratio to be not greater than 0.9. *See* Hashimura, column 7, lines 25 to 33. On the other hand,

the sag resistance (permanent fatigue property) of the wire is ensured by setting the yield strength ratio to be not less than 0.8. *See* column 7, lines 33 to 36.

With respect to the steel wire (ii) of Hashimura, the coiling performance of the wire is ensured by controlling the amount of residual austenite to be not greater than 6%, even if the wire has a yield strength ratio of greater than 0.9. *See* Hashimura, column 7, lines 36 to 40. As with the steel wire (i), the sag resistance (permanent fatigue property) of the steel wire (ii) of Hashimura is ensured by setting the yield strength ratio to be not less than 0.8. *See* column 7, lines 33 to 36.

With both the steel wire (i) and the steel wire (ii) of Hashimura, the yield strength ratio is set to be not less than 0.8. This setting is necessary to balance the coiling performance and sag resistance of the disclosed wires. By contrast, the yield strength ratio of the wire of claim 1 is 0.79 or lower. Hashimura teaches away from setting the yield strength ratio as provided in claim 1.

The wire of claim 1 is prepared to have a yield strength ratio 0.79 or lower before coiling. That is, the wire of claim 1 has a low 0.2% proof stress so that is capable of superior coiling performance (cold workability) relative to conventional steel wire. *See* present specification, page 3, lines 10 to 12. The 0.2% proof stress ($\sigma_{0.2}$) of the wire of claim 1 may be increased by precipitation strengthening in an annealing process or a nitriding process after coiling. *See* present specification, page 12, line 11 to page 13, line 16. The wire of claim 1 thus has superior coiling performance (workability) to wires, such as disclosed in Hashimura. *See* present specification, page 23, lines 4 to 5.

Although the yield strength ratio ($\sigma_{0.2}/ \sigma_B$) of the wire of claim 1 is lower than the yield strength ratio of the wires of Hashimura, the small grain size employed in the wire of claim 1 (grain size number of prior austenite is 11.0 or larger) effectively improves sag resistance of the wire upon annealing or nitriding after coiling. In addition, the grain size

number of prior austenite of 11.0 or larger also improves fatigue life. Hashimura does not disclose or suggest a wire composed as recited in claim 1, or recognize the benefits stemming therefrom.

There is nothing in Hashimura that would have led one of ordinary skill in the art to control the yield strength ratio to be 0.79 or lower or to control the grain size number of prior austenite to be 11.0 or larger, as recited in claim 1. For the reasons discussed above, Hashimura fails to disclose or suggest each and every feature of claim 1.

As explained, claim 1 would not have been rendered obvious by Hashimura. Claims 2-6 depend from claim 1 and, thus, also would not have been rendered obvious by Hashimura. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Double Patenting

The Office Action provisionally rejects claims 1 and 2 under the judicially created doctrine of obviousness-type double patenting over claims 1-4 of U.S. Patent Application No. 10/550,019. Applicants respectfully request the rejection be held in abeyance until the 019 application is allowed or the present application is otherwise in condition for allowance.

Conclusion

For the foregoing reasons, Applicants submit that claims 1-6 are in condition for allowance. Prompt reconsideration and allowance are respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon

Jacob A. Doughty
Registration No. 46,671

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)